JC03 Rec'd PCT/PTO 29 OCT 2001

FORM PTO-1390 (REV. 11-2000)

U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY 'S DOCKET NUMBER: 2097-3-01

U.S. APPLICATION NO. (If known, see 37 CFR 1.5: Unknown 10/030776

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/KR00/00652	June 22, 2000	March 29, 2000

TITLE OF INVENTION An Electrical Transmission System for Multiple Pictures and Its Transmission Method Through Internet

APPLICANT(S) FOR DO/EO/US So Kwon

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [ ] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   - a. [X] is attached hereto (required only if not communicated by the International Bureau).
   - b. [ ] has been communicated by the International Bureau.
   - c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   - a. [X] is attached hereto.
   - b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [X] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   - a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   - b. [ ] have been communicated by the International Bureau.
   - c. [X] have not been made; however, the time limit for making such amendments has NOT expired.
   - d. [ ] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A FIRST preliminary amendment.
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [ ] A substitute specification.
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [ ] Other items or information:

531 Rec'd PCT/PTO 29 OCT 2001

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
Unknown 10/030776	PCT/KR00/00652	2097-3-01

21. [X] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):	CALCULATIONS PTO USE ONLY
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $1000.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $860.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $710.00	
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) $690.00	
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 1,040
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	7 - 20 =	0	x $18.00	$ 0
Independent claims	2 - 3 =	0	x $80.00	$ 0
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$ 0
TOTAL OF ABOVE CALCULATIONS =				$ 1,040
[X] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.			+	$ 520
SUBTOTAL =				$ 520
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$ 0
TOTAL NATIONAL FEE =				$ 520
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$
TOTAL FEES ENCLOSED =				$ 520
			Amount to be refunded:	$
			charged:	$

a. [X] A check in the amount of $ 520 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [ ] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. _____. A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

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SIGNATURE

Jonathan Y. Kang
NAME

38,199
REGISTRATION NUMBER

AN ELECTRICAL TRANSMISSION SYSTEM FOR MULTIPLE PICTURES AND ITS TRANSMISSION METHOD THROUGH INTERNET

BACKGROUND OF THE INVENTION

The present invention relates to an electrical transmission system for multiple pictures and its transmission method through internet. More particularly, the present invention relates to an electrical transmission system for multiple pictures and its transmission method through internet, that a digital camera assembly is equipped with the plurality of lenses and CCDs(Charge Coupled Devices), so that pictures captured from many directions are transmitted to a client computer through internet and the captured pictures are transmitted to a screen of the client computer in a real time according to a required condition selected by a client.

In general, picture communication means that a user's computer and the other party's computer, which are geographically separated but connected with each other through a network, simultaneously transmit image and/or sound data applied from each computer to an application program of the user's computer and to an application program of the other party's computer, so that the computer program of the other party can interchange information with the user's computer program according to the received image and/or sound data to do video conference or video phone call with each other even in a remote place.

To do video communication with the separated other party through the network using a video communication system, a digital camera to transfer image and sound information is used. However, because a conventional camera is fixed in one position, it cannot capture the image of the other party properly, thereby the user cannot easily receive the picture of the other party.

Furthermore, because the conventional video communication system transfers picture captured only at a fixed angle through the digital camera, to transfer pictures captured at other angles, the user(client) must change the angle of the digital camera.

Meanwhile, another example that a lens portion capable of rotating in every direction is mounted on a monitor of the computer has been made to solve the above problems. However, there is a problem that the camera cannot quickly capture a mobile image following it.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide an electrical transmission system for multiple pictures and its transmission method through internet, that a digital camera assembly is equipped with a number of lenses and CCDs(Charge Coupled Devices), so that pictures captured from many directions are transmitted to a client computer through internet and the captured pictures are transmitted onto a screen of the client computer in a real time according to a required condition selected by a client.

To accomplish the above object, the present invention provides an electrical transmission system for multiple pictures through internet, the transmission system comprising: a digital camera assembly having a number of lenses and a number of CCDs for transforming image signal of the image entered through each lens into electrical signal; a link server that a number of client computers are connected through internet network; and a computer system compressing image signal of the subject captured by the CCDs according to the required condition selected by the client and transmitting the compressed image data, which is converted into data format for video

communication, to the link server through communication network.

To accomplish the above object, the present invention provides a method for electricalally transmitting multiple pictures through internet, the method comprising the steps of: determining picture transmission mode meeting the required condition selected by the client; processing the pictures to be transmitted according to the determined transmission mode; and transmitting the processed picture to the link server.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 is a block diagram of an electrical transmission system for multiple pictures through internet according to the present invention;

Figure 2 is a perspective view of an external appearance of a digital camera assembly of the transmission system according to the present invention;

Figure 3 is a flow diagram showing a method for transmitting multiple pictures through internet according to the present invention; and

Figures 4a to 4c are views showing a state that full motion images are shown on a monitor of a client computer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 illustrates a block diagram of an electrical transmission system for multiple pictures through internet according to the present invention, and Figure 2

illustrates a perspective view of an external appearance of a digital camera assembly of the transmission system.

As shown in the drawings, the electrical transmission system for multiple picture of the present invention comprises: a digital camera assembly 10 having a number of lenses 12 and a number of CCDs(Charge Coupled Devices) 14 for transforming image signal entered through each lens 12 into electrical signal; a link server 20 connecting a number of client computers 40 through an internet network 30; and a computer system 50 compressing image signal of the subject captured by the CCDs 14 according to a required condition selected by a client and transmitting the compressed image data, which is converted into data format for video communication, to the link server 20 through communication network.

Referring to Figure 2, the digital camera assembly 10 includes a body 11 in the form of beehive, in which a number of lenses 12 and CCDs 14 are installed to capture an image in many directions and a supporter 13 for supporting the body 11.

The computer system 50 includes: a CDS/AGS(Correlated Double Sampling/Automatic Gain Control) 51 for removing noise of the electrical signal received from the CCDs 14 of the digital camera assembly 10 and for automatically amplifying and controlling gain to uniformly output despite the level change of the image signal; an A/D converter 52 for converting analog signal input from the CDS/AGS 51 into digital signal; a compression unit 53 for compressing the captured image signal to get a large number of images; a control unit 54 for controlling the compression unit 53 according to a picture transmission mode selected by the client; a compression and storage memory 55 for individually storing the compressed images output from the compression unit 53; an image processing unit 56 for composing or

separating each of the images; and a data transmission unit 57 for transmitting the images, which are composed or separated by the image processing unit 56, to the link server 20 to the transmit the images to the client computer.

Referring to Figures 3 to 4c, the operation of the present invention will be described in detail.

Figure 3 illustrates a flow diagram showing a method for transmitting multiple pictures through internet according to the present invention, and Figures 4a to 4c illustrate views showing a state that full motion pictures are shown on a monitor of the client computer.

As shown in Figure 2, a captured image projected through lenses 12(1,2,3,4,5.....N) is converted into electrical signal in the CCDs 14 (1,2,3,4,5.....N).

Meanwhile, the CDS/AGS 51 removes noise of the electrical signal input from the CCDs 14 and automatically amplifies and controls gain, so that the electrical signal can be always output uniformly despite the level change of the input image signal.

The A/D converter 52 converts analog signal input from the CDS/AGS 51 into digital signal.

The compression processing unit 53 compresses the captured image signal to get a large number of images. The image signal output from the A/D converter 52 is compressed in a form of JPEG(Joint Photographic coding Experts Group).

At this time, the compression rate of the image signal input from the compression processing unit 53 is generally about 10:1.

The compression and storage memory 55 individually stores the compressed images output from the compression unit 53.

Furthermore, the compression and storage memory 55 makes high-speed record and revival possible, and generally uses a flash memory, which is a fixed memory.

The image processing unit 56, which is to individually separate or generally or partially compose the images stored in the compression and storage memory 55, makes the images to be shown on the screen of the client computer individually, to be shown on the screen of the client computer in a partially composed state, or to be shown on the screen of the client computer in a generally composed state.

The data transmission unit 57 transmits the images, which are composed or separated by the image processing unit 56, to the link server 20 to transmit the images to the client.

The control unit 54 basically controls the compression processing unit 53, and also controls the general operation of the CCDs 14, the CDS/AGS 51, A/D converter 52, the compression and storage memory 55, the image processing unit 56 and the data transmission unit 57.

Meanwhile, the composed or separated images, which are transmitted to the link server 30 through a network 21 by the operation of the data transmission unit 57, are transmitted to the client computer connected to the link server 20 through an internet network 30.

The transmitted images are shown on at least one or more monitors 41 of client computers in a real time.

Here, the client can choose the images, transmitted through the plural lenses 12 and CCDs 14 of the digital camera assembly, in various types.

That is, the client can choose image selection modes of several types, which

are provided in the link server 20 to see all images of separated state, transmitted from each of the CCDs (1,2,3,4,5,.....N) 14 on the monitor 41.

The control unit 54 of the computer system 50 determines the image selection mode meeting the required condition selected by the client 40.

After that, the computer system 50 determines the transmission mode and performs the step of processing the picture to be transmitted.

After performing the above step, the computer system 50 performs the step of transmitting the processed picture to the link server 20.

Meanwhile, as the result of determination of the above step, when the required condition selected by the client 40 is determined as that the image processing unit 56 separates the pictures individually(S10), the computer system 50 separates the pictures individually (S20) and transmits them to the link server 20.

Thereby, as shown in Figure 4a, all the pictures, i.e., images of the other party, are shown in the separated state on the monitor 41 as many in the number as the CCDs 14 mounted on the digital camera assembly 10, so that the client can see all directions of the photographing place in one spot.

As the result of determination of the step(S10), when the required condition selected by the client 40 is determines as that the image processing unit 56 partially composes the pictures, i.e., the image of the other party(S30), the computer system 50 composes the pictures partially and transmits them to the link server 20.

Thereby, as shown in Figure 4b, the pictures, i.e., the pictures of the other party, are shown on the monitor 41 in the partially composed state, so that the client can see all directions of the photographing place in one spot.

As the result of determination of the step(S30), when the required condition

selected by the client 40 is determines as that the image processing unit 56 composes the pictures, i.e., the images of the other party, generally, the control unit 54 composes the pictures generally and transmits them to the link server 20.

Thereby, as shown in Figure 4c, the pictures, i.e., the image of the other party, are shown on the monitor 41 in the generally composed state, so that the client can see all directions of the photographing place in one spot.

As described set forth, the picture transmission system of the present invention includes the digital camera assembly, which is equipped with the plurality of lenses and CCDs, so that the pictures captured from many directions are transmitted to the client computer through internet and the captured pictures are transmitted to the screen of the client computer in the real time according to a required condition selected by the client

It will be apparent to those skilled in the art that various modifications and variations can be made in an electrical transmission system for multiple pictures and its transmission method through internet of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

WHAT IS CLAIMED IS:

1. An electrical transmission system for multiple pictures through internet, the transmission system comprising:

a digital camera assembly having a number of lenses and a number of CCDs(Charge Coupled Devices) for transforming image signal of captured image entered through each lens into electrical signal;

a link server connecting a number of client computers through an internet network; and

a computer system compressing image signal of the image captured by the CCDs according to the required condition selected by a client and transmitting the compressed picture data to the link server through communication network, the picture data being converted into a data format for video communication.

2. An electrical transmission system for multiple pictures through internet as claimed in claim 1, wherein the digital camera assembly includes a body in the form of beehive and a supporter for supporting the body, the body being equipped with the lenses and CCDs to capture the image in many directions.

3. An electrical transmission system for multiple pictures through internet as claimed in claim 1, wherein the computer system includes:

a CDS/AGS(Correlated Double Sampling/Automatic Gain Control) for removing noise of the electrical signal received from the CCDs and for automatically amplifying and controlling gain to uniformly output despite the level change of the

image signal; an A/D converter for converting analog signal input from the CDS/AGS into digital signal; a compression unit for compressing the captured image signal to get a large number of images; a control unit for controlling the compression unit according to a picture transmission mode selected by the client; a compression and storage memory for individually storing the compressed images output from the compression unit; an image processing unit for composing or separating each of the images; and a data transmission unit for transmitting the images, which are composed or separated by the image processing unit, to the link server to transmit the images to the client computer.

4. An electrical transmission method for multiple pictures through internet, the method comprising the steps of:

determining the picture transmission mode meeting a required condition selected by the client;

processing the picture to be transmitted;

transmitting the processed picture to the link server.

5. An electrical transmission method for multiple pictures through internet as claimed in claim 4, wherein the transmission method includes the step of transmitting the pictures, individually separated by the image processing unit according to the required condition selected by the client, onto a screen of a client monitor in division.

6. An electrical transmission method for multiple pictures through internet as claimed in claim 4, wherein the transmission method includes the step of transmitting

the pictures, partially composed by the image processing unit according to the required condition selected by the client, onto the screen of the client monitor.

7. An electrical transmission method for multiple pictures through internet as claimed in claim 4, wherein the transmission method includes the step of transmitting the pictures, generally composed by the image processing unit according to the required condition selected by the client, onto the screen of the client monitor.

Fig. 1

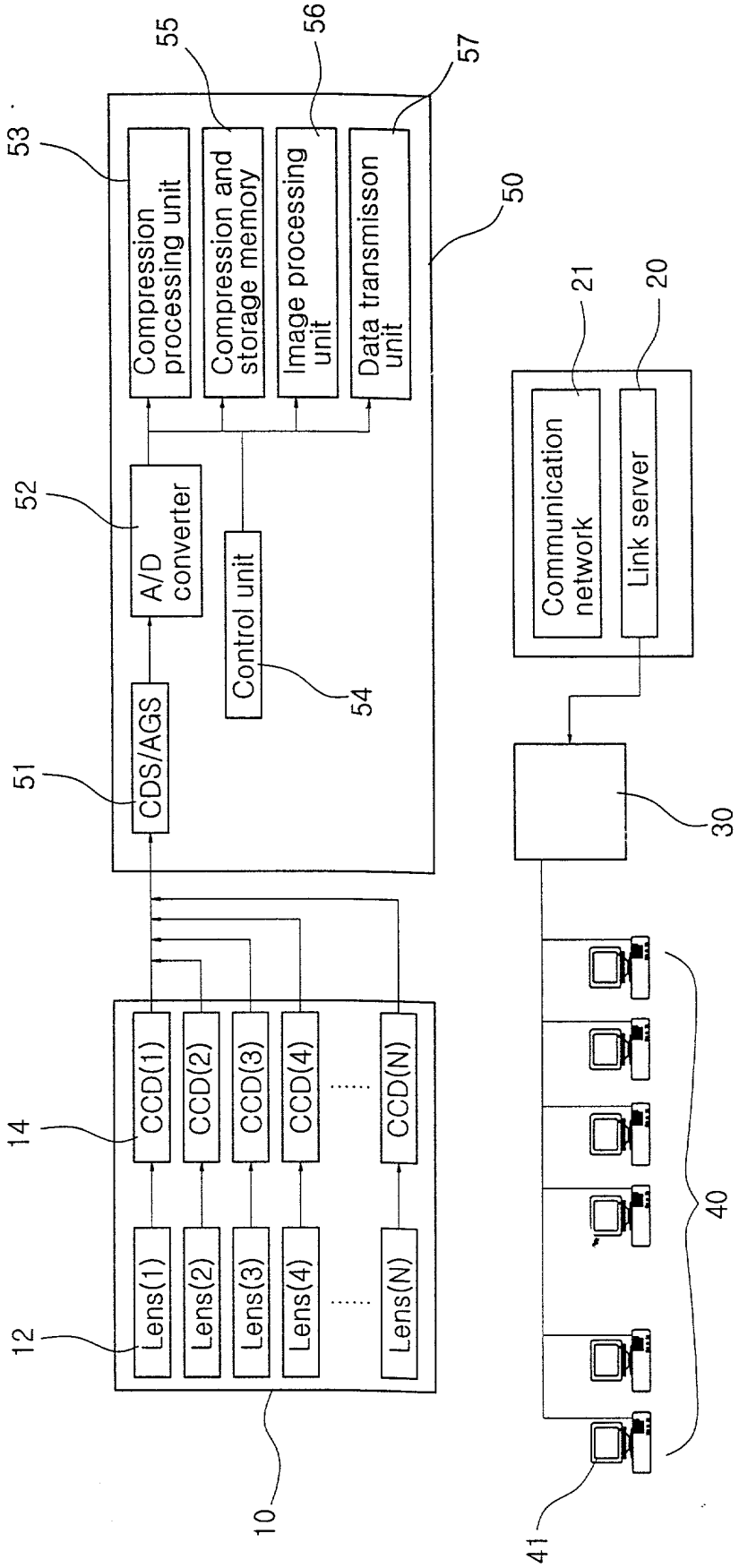

Lens(1)
Lens(2)
Lens(3)
Lens(4)
Lens(N)
CCD(1)
CCD(2)
CCD(3)
CCD(4)
CCD(N)
CDS/AGS
A/D converter
Control unit
Compression processing unit
Compression and storage memory
Image processing unit
Data transmisson unit
Communication network
Link server
10
12
14
30
40
41
50
51
52
53
54
55
56
57
20
21

Fig. 2

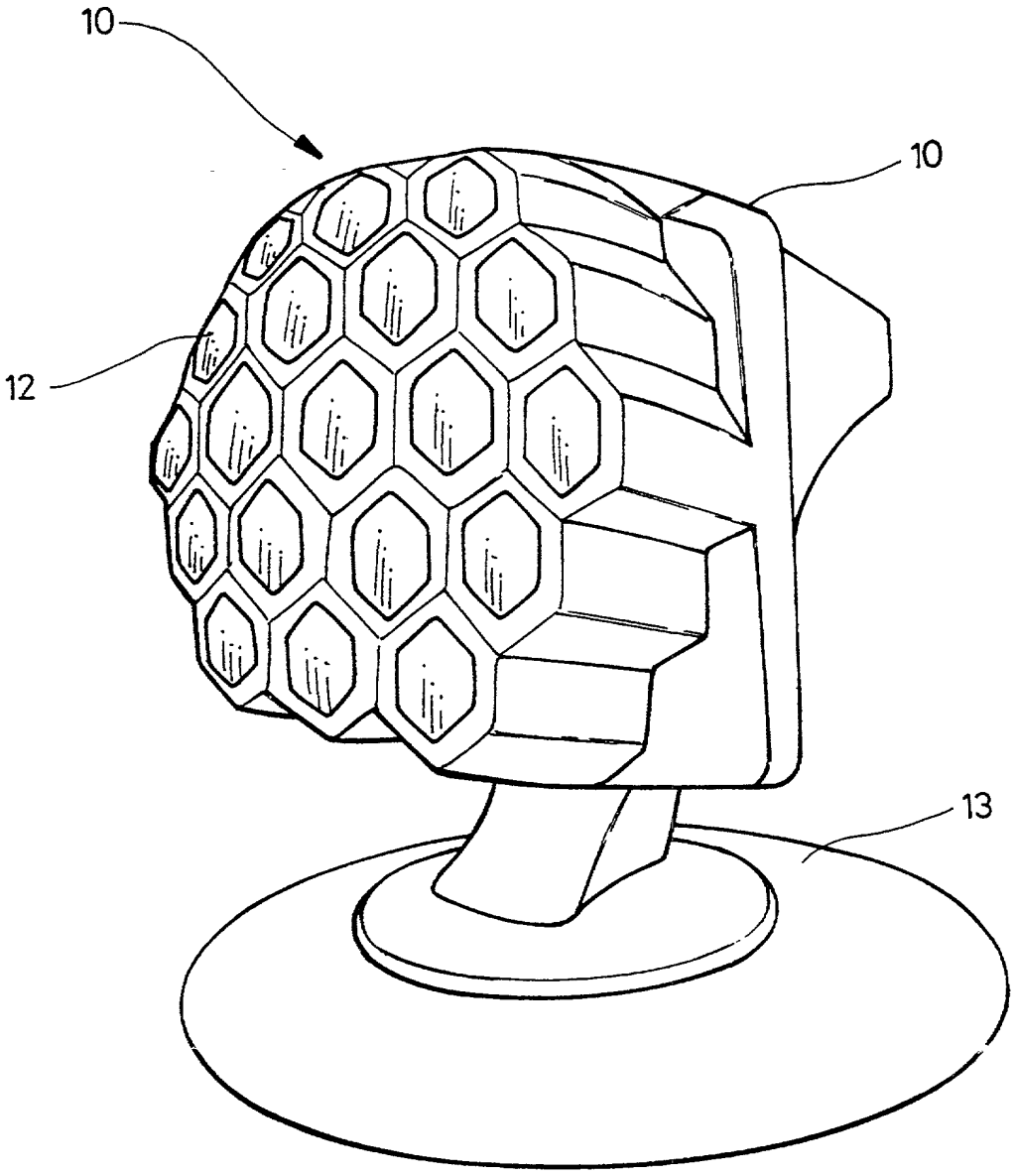


Fig. 3

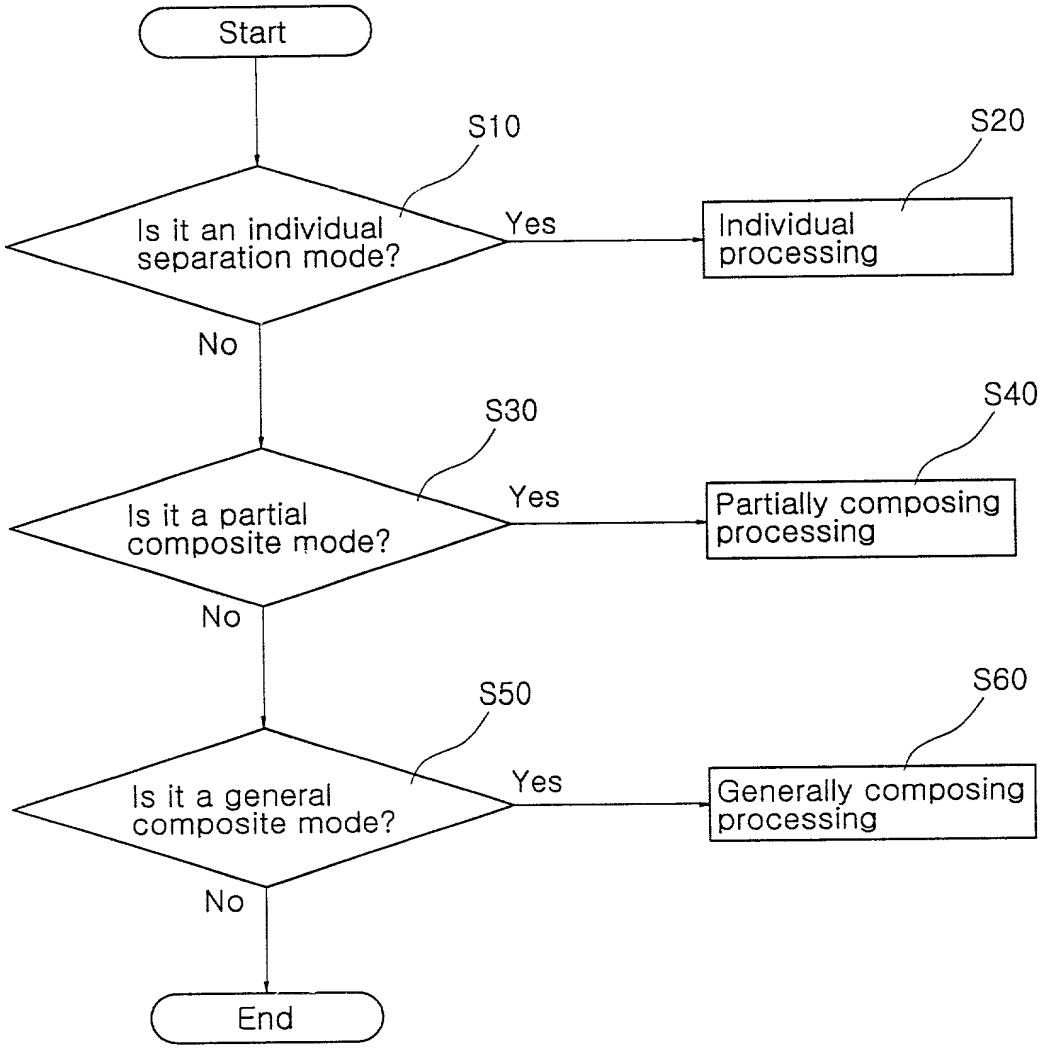

Start
S10
Is it an individual separation mode?
Yes
S20
Individual processing
No
S30
Is it a partial composite mode?
Yes
S40
Partially composing processing
No
S50
Is it a general composite mode?
Yes
S60
Generally composing processing
No
End

Fig. 4a

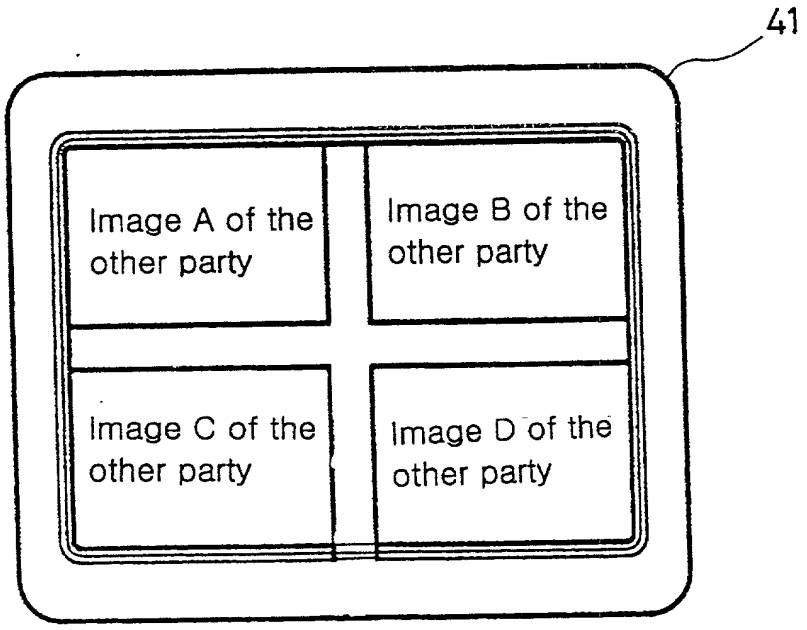

41
Image A of the other party
Image B of the other party
Image C of the other party
Image D of the other party

Fig. 4b

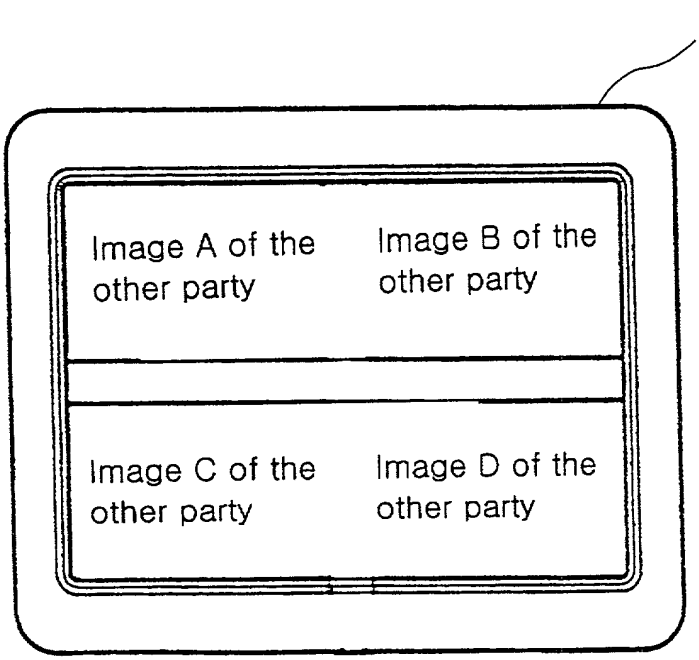
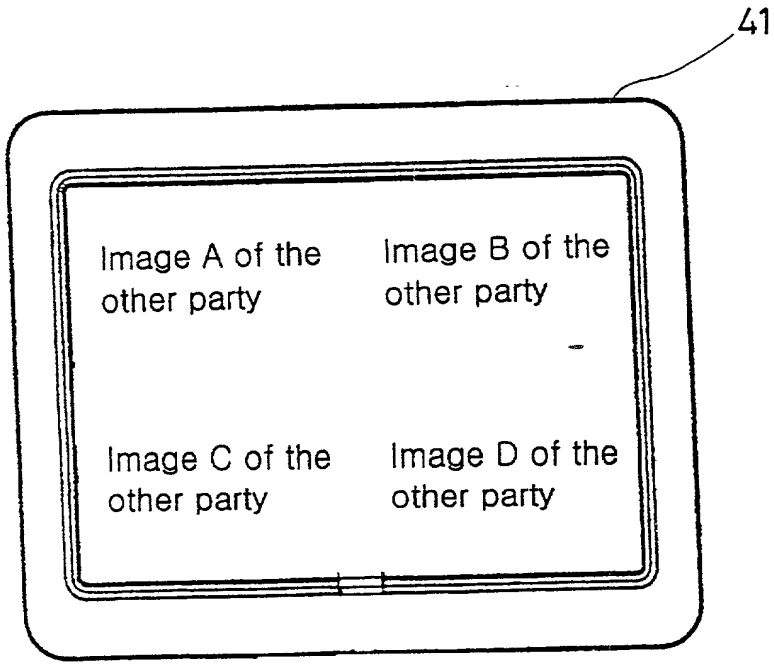

41
Image A of the other party
Image B of the other party
Image C of the other party
Image D of the other party

Fig. 4c



ATTORNEY'S DOCKET NO. 2097-3-01

DECLARATION and POWER OF ATTORNEY

☒ ORIGINAL
☐ CONTINUATION-IN-PART
☐ DIVISIONAL

As a below named inventor, I declare that the information given herein is true, that I believe that I am the original, first and sole inventor (if only one name is listed as 1 below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

An Electrical Transmission System for Multiple Pictures and Its Transmission Method Through Internet

the specification of which is attached hereto unless the following box is checked:

☐ was filed on June 22, 2000 as United States Application Number or PCT International Application Number PCT/KR00/00652
and was amended on _____.

My residence, post office address and citizenship are as stated below next to my name.
I acknowledge my duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations § 1.56(a).
I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.
I hereby claim foreign priority benefits under Title 35, United States Code, § 119 OR 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

COUNTRY	APPLICATION NUMBER	DATE OF FILING Month Day Year	PRIORITY CLAIMED UNDER 35 U.S.C. 119
KOREA	2000-16109	March 28, 2000	YES

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.) (Filing Date) (Status)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or Agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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	Name of Inventor	Residence: CITY	STATE or COUNTRY
3			
	Mailing Address		CITIZENSHIP
	Name of Inventor	Residence: CITY	STATE or COUNTRY
4			
	Mailing Address		CITIZENSHIP

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 1 S. Kwon	SIGNATURE OF INVENTOR 2
DATE Oct. 22, 2001	DATE
SIGNATURE OF INVENTOR 3	SIGNATURE OF INVENTOR 4
DATE	DATE